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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/608,702

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Thomas S. Ellis

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09/22/2004

DELPHI TECHNOLOGIES, INC.

M/C 480-410-202

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TROY, MI 48007

EXAMINER

NGUYEN, DILINH P

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,702

Applicant(s)

ELLIS ET AL.

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-12, 15 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- Regarding claims 1, 3, 15 and 23, the phrase: "...each particle having a ratio of surface area of one of the faces of the particle to the thickness of the particle, and the weight average of the ratios being at least 100 or at least 200..." contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-12, 15 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- Regarding claims 1, 3, 15 and 23, the phrase: "...each particle having a ratio of surface area of one of the faces of the particle to the thickness of the particle, and the weight average of the ratios being at least 100 or at least 200..." is unclear.

What 100 and 200 stand for?

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 6-9 and 23, in so far as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Chheang et al. (U.S. Pub. 2003/0100654).

- Regarding claims 1, 3 and 23, Kaminaga et al. disclose an encapsulated, overmolded and/or underfilled electrical component, comprising:

an electrical component encapsulated 1, overmolded and/or underfilled with a polymeric composite including a synthetic resin matrix 7 and inorganic filler particles substantially uniformly distributed in the matrix (fig. 1a, column 6, lines 10-15).

Kaminaga et al. fail to disclose the particles having a platelet structure.

Chheang et al. disclose a semiconductor device comprising a plurality of particles having a platelet structures (paragraph 0051), wherein the particles having a platelet structure defined by opposite substantially flat and substantially parallel faces, the

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distance between the faces defining a thickness of the particles, each particle having a ratio of surface area of one of the faces of the particle to the thickness of the particle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Kaminaga et al. by having the platelet structure for the particles with the structure as set forth above because as taught by Chheang et al., such the particles having the platelet structure would improve the adhesive properties and improve electrical stability (paragraph 0017).

- Regarding claim 2, Kaminaga et al. disclose wherein the electrical component is a substrate 1 having an electrical circuit formed on at least one surface of the substrate and at least one semiconductor chip 3 electrically connected to the electrical circuit (fig. 1A).
- Regarding claims 6-7, Chheang et al. disclose wherein the filler is a smectite clay mineral and wherein the smectite clay mineral is montmorillonite (paragraph 0064).
- Regarding claims 8-9, Kaminaga et al. disclose the matrix is an epoxy resin (column 3, lines 67 and column 6, line 10).

7. Claims 4-5 and 10-11, in so far as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Chheang et al. (U.S. Pub. 2003/0100654) and further in view of Shin et al. (U.S. Pat. 6593404).

- Regarding claim 10, As discussed in details above, the combination of Kaminaga et al. and Chheang et al. substantially disclose all the limitations as claimed above except for the epoxy package 7 is a thermoplastic resin matrix.

Shin et al. disclose a semiconductor device comprising a thermoplastic resin composition including an inorganic particulate filler (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the thermoplastic resin composition as known material, as taught by Shin et al. into the above combination for forming a polymeric composite, such the thermoplastic resin would provide excellent stress cracking resistance and improve heat resistance (column 2, lines 54-56). Moreover, selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

- Regarding claim 11, Shin et al. disclose the resin is selected from the group consisting of polycarbonate and copolymer (abstract).
- Regarding claims 4-5, Shin et al. disclose the inorganic filler is 0 to 50 parts by weight based on 100 parts by weight of the polymeric composite (column 6, lines 57-62).

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Chheang et al. (U.S. Pub. 2003/0100654) and further in view of Capote et al. (U.S. Pat. 6335571).

As discussed in details above, the combination of Kaminaga et al. and Chheang et al. substantially disclose all the limitations as claimed above except for the composite has a CTE from about 5 to 20 ppm/°C.

However, Capote et al. disclose a semiconductor device comprising a composite has a CTE from about 5 to 20 ppm/°C (cover fig., column 8, lines 15-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of the above combination to minimize the stress on the solder joint for the composite, as shown by Capote et al. (column 8, lines 17-19).

9. Claims 13-14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Shin et al. (U.S. Pat. 6593404).

- Regarding claim 13, Kaminaga et al. disclose an encapsulated, overmolded and/or underfilled electrical component, comprising:
an electrical component encapsulated 1, overmolded and/or underfilled with an epoxy package matrix 7 and an inorganic particulate filler (fig. 1a, column 6, lines 10-15).

Kaminaga et al. fail to disclose the epoxy package 7 is a thermoplastic resin matrix.

Shin et al. disclose a semiconductor device comprising a thermoplastic resin composition including an inorganic particulate filler (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the thermoplastic resin composition as known material, as taught by Shin et al. into the device

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structure of Kaminaga et al. for forming a polymeric composite, such the thermoplastic resin would provide excellent stress cracking resistance and improve heat resistance (column 2, lines 54-56). Moreover, selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

- Regarding claim 14, Kaminaga et al. disclose wherein the electrical component is a substrate 1 having an electrical circuit formed on at least one surface of the substrate and at least one semiconductor chip 3 electrically connected to the electrical circuit (fig. 1A).
- Regarding claims 16-17, Shin et al. disclose the inorganic filler is 0 to 50 parts by weight based on 100 parts by weight of the polymeric composite (column 6, lines 57-62).
- Regarding claims 18-19, Shin et al. disclose the filler is montmorillonite (column 3, lines 55-60).
- Regarding claim 20, Shin et al. disclose the resin is selected from the group consisting of polycarbonate and copolymer (abstract).

10. Claim 15, in so far as it is understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Shin et al. (U.S. Pat. 6593404) and further in view of Chheang et al. (U.S. Pub. 2003/0100654).

Kaminaga et al. and Shin et al. fail to disclose each particle has a ratio of surface area on one of the faces of the particle to the thickness of the particle.

Chheang et al. disclose a semiconductor device comprising a plurality of particles having a platelet structures (paragraph 0051), wherein the particles having a platelet structure defined by opposite substantially flat and substantially parallel faces, the distance between the faces defining a thickness of the particles, each particle having a ratio of surface area of one of the faces of the particle to the thickness of the particle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device structure of Kaminaga et al. and Shin et al. by having the platelet structure for the particles with the structure as set forth above because as taught by Chheang et al., such the particles having the platelet structure would improve the adhesive properties and improve electrical stability (paragraph 0017).

11. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminaga et al. (U.S. Pat. 6257215) in view of Shin et al. (U.S. Pat. 6593404) and further in view of Yu et al. (U.S. Pat. 5153657).

As discussed in details above, the combination of Kaminaga et al. and Shin et al. substantially disclose all the limitations as claimed above except for the inorganic filler is glass spheres.

Yu et al. disclose an inorganic filler is glass spheres (column 13, lines 45) and wherein an average diameter of from about 1 micrometer to about 3 micrometers (column 14, lines 36-37). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select glass spheres as known material, as taught by Yu et al. into the device structure of the above combination for forming the inorganic fillers as being claimed

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since the glass spheres would maintain good conformance in the lateral direction (column 12, lines 31-32). Moreover, selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN

LONG PHAM
PRIMARY EXAMINER